

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A counterfeit eye discrimination method comprising the steps of:

receiving image data of ~~a photocopy~~ an image including an eye; and

detecting presence or absence of roughness in the image by image processing to the image data;

wherein the eye is judged to be a counterfeit eye that is a reproduction of a living eye when roughness is detected in the image.

2. (original) The counterfeit eye discrimination method of Claim 1,

wherein the image processing includes the steps of:

performing band limitation to the image data; and

extracting a predetermined feature from the band-limited image data,

wherein the presence or absence of roughness is detected using the extracted feature data.

3. (original) The counterfeit eye discrimination method of Claim 2,

wherein the predetermined feature is one of or a combination of two or more of moment, central moment, skewness and kurtosis of pixel values.

4. (original) The counterfeit eye discrimination method of Claim 2, wherein pixel coordinate values are used in combination with pixel values in the extraction of the predetermined feature.

5. (original) The counterfeit eye discrimination method of Claim 2, wherein a center of a pupil or an iris is used in combination with pixel values in the extraction of the predetermined feature.

6. (original) The counterfeit eye discrimination method of Claim 2, wherein a high-pass filter or a band-pass filter is used in the band limitation.

7. (original) The counterfeit eye discrimination method of Claim 2, wherein the extraction of the predetermined feature is performed to a vicinity of an iris region or a pupil region.

8. (original) The counterfeit eye discrimination method of Claim 2, wherein the extraction of the predetermined feature is performed to a region on or in a vicinity of a line passing through a center of a pupil or a center of an iris.

9. (original) The counterfeit eye discrimination method of Claim 1, wherein the image processing includes the steps of:
performing frequency analysis to the image data;
extracting a predetermined feature from the frequency-analyzed data.

10. (currently amended) A counterfeit eye discrimination method comprising the steps of:

receiving image data of ~~a photocopy~~ an image including an eye;
performing band limitation to the whole image data;
extracting a predetermined feature from the band-limited image data; and
recognizing whether the eye is a counterfeit eye that is a reproduction of a living eye, or a living eye based on data of the extracted feature.

11. (original) The counterfeit eye discrimination method of Claim 10,
wherein in the recognition step,
distributions of the predetermined feature of living eye images and counterfeit eye images are respectively prepared beforehand,

a distance to data of the extracted feature from the feature distribution of the living eye images and a distance thereto from the feature distribution of the counterfeit eye images are calculated, and

the eye is judged to be an eye belonging to the distribution, from which the calculated distance is the shorter between the living eye and the counterfeit eye.

12. (currently amended) A counterfeit eye discrimination device comprising:
an image input section that inputs image data of an image including an eye;
a band limitation section that performs band limitation to the whole image data input in the image input section;
a feature extraction section that extracts a predetermined feature from the image data processed by the band limitation section; and
a recognition section that recognizes whether the eye is a counterfeit eye that is a reproduction of a living eye, or a living eye based on data of the feature extracted by the feature extraction section.

13. (currently amended) A computer-readable medium encoded with a program allowing a computer to execute the steps of:
performing band limitation to the whole image data of an image including an eye;
extracting a predetermined feature from the band-limited image data; and
recognizing whether the eye is a ~~photocopy of an~~ counterfeit eye that is a reproduction of a living eye, or a living eye based on data of the extracted feature.

14. (original) An iris authentication method comprising the steps of:
performing iris authentication based on image data of an image including an eye;
and
performing the counterfeit eye discrimination method of Claim 1 or Claim 10 to the image data when a subject is authenticated as a person himself or herself in the iris authentication step.

15. (currently amended) A counterfeit printed matter discrimination method, characterized by comprising the steps of:

receiving image data of ~~a photocopy~~ an image of a bill or valuable paper; and
detecting presence or absence of roughness in the image by image processing to the image data,

wherein the bill or the valuable paper is judged to be a counterfeit printed matter when roughness is detected in the image.

16. (original) An image discrimination method comprising the steps of:
receiving image data of an image; and
detecting presence or absence of roughness in the image by image processing to the image data,

wherein the image is judged to be an image projecting a printed matter when roughness is detected in the image.